

Appl No. 10/647,927  
Response dated December 14, 2005  
Reply to Office Action of Sept. 15, 2005

IN THE CLAIMS:

Please amend the claims to read as follows:

Claims 1 through 35 (Canceled)

36. (New) A jarring apparatus that multiplies tension to provide greater overpull, the apparatus comprising:

- a. an outer tube;
- b. an inner tube moveable within the outer tube, attached at a first upper end to the pipe string;
- c. a third tube between the outer and inner tubes that is engaged to the stuck object;
- d. a compressible energizing fluid within a space between the inner and third tubes when the inner tube is raised to a first up cocked position; and
- e. a first differential surface area between the inner tube and the third tube and a second differential surface area between the outer tube and inner tube, so that when tension is applied to the inner tube, the tension is multiplied to the outer tube by virtue of the compressible fluid acting on the differential areas, thereby allowing the outer tube to deliver a multiplied jarring force to the stuck object.

37. (New) The apparatus in claim 36, wherein there may be further provided a plurality of hammer and compression subs to increase the jarring force within the tool.

38. (New) The apparatus in claim 37, wherein the compressible fluid further comprises nitrogen gas or other suitable compressible inert fluid.

39. (New) The apparatus in claim 37, further comprising means for allowing the outer tube to move upward in a controlled manner further comprises a metering chamber for allow fluid flow therethrough.

40. (New) The apparatus in claim 37, wherein the upward jarring force is created by the expansion of the compressed fluid within the tool to effect the tension multiplier effect.

41. (New) A jarring apparatus that multiplies tension to provide greater overpull, the apparatus comprising:

- a. an outer tube;

- b. an inner tube moveable within the outer tube, attached at a first upper end to the pipe string;
- c. a third tube between the outer and inner tubes that is engaged to the stuck object;
- d. a compressible energizing fluid, such as nitrogen gas, within a space between the inner and third tubes when the inner tube is raised to a first up cocked position; and
- e. a first differential surface area between the inner tube and the third tube and a second differential surface area between the outer tube and inner tube, so that when tension is applied to the inner tube, the tension is multiplied to the outer tube by virtue of the compressible fluid acting on the differential areas, thereby allowing the outer tube to deliver a multiplied jarring force to the stuck object.

42. (New) The apparatus in claim 41, wherein the apparatus further comprises a first anvil and metering sub, a hammer and compression sub, a multiplier sub and an upper spline sub.

43. (New) The apparatus in claim 41, wherein there is further provided a plurality of hammer and compression subs to enhance the jarring effect of the apparatus.

44. (New) The apparatus in claim 41, wherein the differential areas in the apparatus multiplies the overpull by a factor of 1.1 to 15 to define a greater jarring effect.

45. (New) The apparatus in claim 41, further comprising metering fluid for metering the movement of the hammer portion before the expansion of the compressed fluid causes the hammer to jar against the anvil portion of the tool.

46. (New) A jarring apparatus that multiplies tension to provide greater overpull, the apparatus comprising:

- a. an outer tube;
- b. an inner tube moveable within the outer tube, attached at a first upper end to the pipe string;
- c. a third tube between the outer and inner tubes that is engaged to the stuck object;
- d. raising the inner tube to a first up-cocked position; and

- e. compressing a first energizing fluid within a space between the inner and third tubes when the inner tube is raised to the first up-cocked position;
- f. defining a first differential surface area between the inner tube and the third tube;
- g. defining a second differential surface area between the outer tube and the inner tube; and
- h. applying tension to the inner tube so that the tension is multiplied to the outer tube by virtue of the compressible fluid acting on the differential areas thereby allowing the outer tube to deliver a multiplied jarring force to the stuck object.

47. (New) The method in claim 46, further providing the step of providing a second fluid within the tool to meter the movement of the second tube as it moves from a first energized position to a second fired position.

48. (New) The method in claim 47, further comprising the step of resetting the tool to an energized position to repeat steps e and f.

49. (New) A process for multiplying the force against an object, comprising the following steps:

- providing a compressive inner tube;
- compressing a fluid by upward pull on the inner tube by a long stroke acting on a first piston area; and
- allowing the fluid to expand against a second piston area over a relatively short stroke, wherein upon expansion of the fluid the upward force is multiplied by a factor of 1.2 to 15 as a jarring force.

50. (New) The process in claim 47, wherein the long stroke multiplied by nominal tension yields a short stroke multiplied by the factor of 1.2 to 15 or greater.

51. (New) An apparatus for providing up and down jarring to tools within a borehole, comprising:

- a. a first external body section;
- b. a piston rod within the first body section defining a first fluid chamber therebetween;

- c. an internal shaft within a portion of the body section defining a second fluid chamber therebetween;
- d. a compressible fluid housed within said first and second chambers;
- e. means for exerting a compressive force on said first fluid chamber to overcome the compressive force within the second fluid chamber to the extent that the compressive force in the first chamber forces the body section and internal shaft to jar against one another imparting an upward jarring motion to the lodged tool.

52. (New) An apparatus for providing up and down jarring to tools lodged within a borehole, comprising:

- a. a first external body section;
- b. a piston rod within the first body section defining a first fluid chamber;
- c. an internal shaft within a portion of the body section defining a second fluid chamber;
- d. a compressible fluid housed within said first and second chambers;
- e. means for exerting a compressive force on said second fluid chamber to overcome the compressive force within the first fluid chamber to the extent that the compressive force in the second chamber forces the body section and internal shaft to jar against one another imparting a downward jarring motion to the lodged tool.

53. (New) A jarring method within a bore hole, comprising the steps of:

- a. providing a tool having a first external body section; a piston rod within the first body section defining a first fluid chamber; and an internal shaft within a portion of the body section defining a second fluid chamber;
- b. filling the first fluid chamber with a quantity of compressible fluid to provide a fluid pressure within the first fluid chamber;
- c. filling the second fluid chamber with a quantity of compressible fluid to provide a fluid pressure within the second fluid chamber;
- d. compressing the fluid in the first fluid chamber to a pressure exceeding the pressure in the second fluid chamber;

e. allowing the fluid in the first fluid chamber to expand with a force capable of exerting an upward jarring force between the internal shaft and the body section.

54. (New) A method of jarring a tool in a bore hole, comprising the steps of:

a. providing a tool having a first external body section; a piston rod within the first body section defining a first fluid chamber; and an internal shaft within a portion of the body section defining a second fluid chamber;

b. filling the first fluid chamber with a quantity of compressible fluid to provide a fluid pressure within the first fluid chamber;

c. filling the second fluid chamber with a quantity of compressible fluid to provide a fluid pressure within the second fluid chamber;

d. compressing the fluid in the second fluid chamber to a psi exceeding the psi in the first fluid chamber;

e. allowing the fluid in the second fluid chamber to expand with a force capable of exerting a downward jarring force between the internal shaft and the body section.

55. (New) An apparatus for jarring downward by multiplying tension to provide a greater downward force, the apparatus comprising:

a. an outer housing;

b. an inner housing;

c. a tension rod moveable within the inner and outer housings, the tension rod attached at a first upper end to a line;

d. a spring member positioned within an annular space between the outer and inner tubes extending to a lower anvil member;

e. a incompressible fluid within a space between the tension rod and the inner housing so that when the tension rod is pulled upward, the incompressible fluid exerts a compression force on the spring member;

e. means for releasing the tension rod from the raised cocked position to energize the spring with a downward jarring force.

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56. (New) The apparatus in claim 55, wherein there are provided differential surface areas related to the fluid and spring for multiplying the upward force against the lodged tool upon release of the spring means.

57. (New) The apparatus in claim 55, wherein hydrostatic pressure in the tube is balanced by ambient pressure acting on an upper piston and on the lower end of the rod and a lower piston.

58. (New) The apparatus in claim 55, wherein a firing mechanism of the tool comprises balls moving from a first position within first grooves when the tool is in a cocked position and to a second position into firing grooves when the tool is fired.

59. (New) The apparatus in claim 55, whereby the tool can be activated without external attachments to the wellbore, wherein the reactive force required to energize the spring means is supplied by the weight of the tool itself.